

IN THE SPECIFICATION:

Please replace paragraph number [0021] with the following rewritten paragraph:

[0021] The apparatus and methods of the present invention apply a modified Fick Equation to calculate changes in partial pressure of carbon dioxide (P_{CO_2}), flow, and concentration to evaluate the cardiac output or pulmonary capillary blood flow of a patient. The traditional Fick Equation, written for CO_2 is:

$$Q = \frac{V_{CO_2}}{(C_{vCO_2} - C_{aCO_2})},$$

where Q is pulmonary capillary blood flow ("PCBF"), V_{CO_2} is the output of CO_2 from the lungs, or "CO₂ elimination," and C_{aCO_2} and C_{vCO_2} are the CO_2 contents of the arterial blood and venous blood CO_2 , respectively. It has been shown in the prior work of others that cardiac output can be estimated from calculating the change in the fraction or volume of CO_2 exhaled by a patient and the partial pressure of end-tidal CO_2 as a result of a sudden change in ventilation. That can be done by applying a differential form of the Fick Equation, as follows:

$$Q = \frac{V_{CO_{2I}}}{(C_{vI} - C_{aI})} = \frac{V_{CO_{22}}}{(C_{v2} - C_{a2})},$$

where $\underline{C_{aCO_2}}$ C_a is the CO_2 content of the arterial blood of a patient, $\underline{C_{vCO_2}}$ C_v is the CO_2 content of the venous blood of the patient, and the subscripts 1 and 2 refer to measured values before a change in ventilation and measured values during a change in ventilation, respectively. The differential form of the Fick Equation can, therefore, be rewritten as:

$$Q = \frac{V_{CO_{21}} - V_{CO_{22}}}{(C_{v_1} - C_{a_1}) - (C_{v_2} - C_{a_2})}$$

or

$$Q = \frac{\Delta V_{CO_2}}{\Delta C_{a_{CO_2}}} = \frac{\Delta V_{CO_2}}{s \Delta PetCO_2},$$

where $\dot{C}V_{CO_2}$ is the change in CO_2 elimination in response to the change in ventilation, $\dot{C}C_{aCO_2}$ is the change in the CO_2 content of the arterial blood of the patient in response to the change in ventilation, $\dot{C}PetCO_2$ is the change in the partial pressure of end-tidal CO_2 , and s is the slope of a CO_2 dissociation curve known in the art. The foregoing differential equation assumes that there is no appreciable change in venous CO_2 concentration during the re-breathing episode, as demonstrated by Capek. Also, a CO_2 dissociation curve, well known in the art, is used for determining CO_2 concentration based on partial pressure measurements.

Please replace paragraph number [0038] with the following rewritten paragraph:

[0038] FIG. 6 is a schematic representation of an alternative embodiment similar to the embodiment shown in FIGS. 5A-5C, wherein the volumes of the inspiratory course and expiratory course of the breathing circuit are adjustably expandable;